Space Weather Forecast

Issued on Wednesday, 21 August 2024 at 01:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Minor to Moderate flares expected, chance of Strong flares, risk reducing slightly. Slight chance of G1/Minor Storms from late Day 1 (21 Aug). Chance of exceeding S1/Minor Radiation Storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate, with the peak flare at 20/1708UTC from a region in the northeast. There are thirteen regions on the visible disc. A large region to the northwest is now approaching the northwest limb and is difficult to analyse due to the viewing angle, but appears to remain a complex region with the potential for large flares. Another large region approaching centre disc in the south has shown some development in its mixed polarity, intermediate spots in recent hours. Similarly a large region in the southeast has also seen some development on its intermediate spots in recent hours and is showing some magnetic complexity. The other sunspot regions are comparatively smaller or less complex.

A CME (Coronal Mass Ejection) associated with the aforementioned M1.3 flare from AR3793 may give some glancing influence at Earth later in the period, but relevant coronagraph imagery is awaited in order to conduct a proper analysis.

Solar Wind / Geomagnetic Activity: The solar wind showed a slow regime. The solar wind speed varied between started around 390km/s and declined to 320 km/s by the end of the period. The Interplanetary Magnetic Field was weak. The north-south component varied weakly but mostly southward directed. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate-class flares are expected with a chance of Strong flares, however the departure of a complex region should see a slight dip in daily risks.

Solar Wind /Geomagnetic Activity: The geomagnetic forecast is of lower-than-average confidence in detail for this period. A CME occurring around 17/1030UTC has a small chance of giving glancing impacts late on Day 1 (21 Aug). A further CME associated with the M1.3 flare at 20/1708UTC may have an Earth directed component, but is currently awaiting coronagraph imagery for analysis.

Some coronal hole fast wind influence is likely early on Day 3, perhaps combining with the CME from 17 August. A second fast wind may again combine with any CME influence from 20 August to bring some increased activity later on Day 4.

Largely Quiet activity is expected at first, perhaps increasing to Unsettled to Active with a slight chance of G1/Minor Storm intervals through Days 2 to 4 under various potential CME and fast wind features.

Energetic Particles / Solar Radiation: Solar radiation is likely to persist at background levels, however there is a chance of exceeding the S1/Minor solar radiation storm level should any notable flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	25	25	25	25
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	75	60	60
Very Active	R3 to R5 X	No	25	20	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	25	25	25	25
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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